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UTILITY PATENT APPLICATION TRANSMITTAL
(Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No. INTL-0055 (P5902)
Total Pages in this Submission

jc588 U.S. PTO 06/26/98

jc135 U.S. PTO 09/105844 06/26/98

TO THE ASSISTANT COMMISSIONER FOR PATENTS
Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

Dynamic Device Profiles

and invented by:

Usha Upadhyayula, Yap-Peng Tan, and Mannan Mohammed

If a CONTINUATION APPLICATION, *check appropriate box and supply the requisite information:*

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: _____

Which is a:

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: _____

Which is a:

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 16 pages and including the following:
   - a. ☒ Descriptive Title of the Invention
   - b. ☐ Cross References to Related Applications *(if applicable)*
   - c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*
   - d. ☐ Reference to Microfiche Appendix *(if applicable)*
   - e. ☒ Background of the Invention
   - f. ☒ Brief Summary of the Invention
   - g. ☒ Brief Description of the Drawings *(if drawings filed)*
   - h. ☒ Detailed Description
   - i. ☒ Claim(s) as Classified Below
   - j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*

   a. ☒ Formal Number of Sheets 6

   b. ☐ Informal Number of Sheets

4. ☒ Oath or Declaration

   a. ☒ Newly executed *(original or copy)* ☐ Unexecuted

   b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*

   c. ☒ With Power of Attorney ☐ Without Power of Attorney

   d. ☐ *DELETION OF INVENTOR(S)*
   Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. ☐ Computer Program in Microfiche *(Appendix)*

7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*

   a. ☐ Paper Copy

   b. ☐ Computer Readable Copy *(identical to computer copy)*

   c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & document(s))*

9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*

10. ☐ English Translation Document *(if applicable)*

11. ☒ Information Disclosure Statement/PTO-1449 ☒ Copies of IDS Citations

12. ☐ Preliminary Amendment

13. ☒ Acknowledgment postcard

14. ☒ Certificate of Mailing

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Docket No. INTL-0055 (P5902)
Total Pages in this Submission

Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

16. ☐ Additional Enclosures *(please identify below):*

Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra		Rate	Fee
Total Claims	29	- 20 =	9	x	$22.00	$198.00
Indep. Claims	4	- 3 =	1	x	$82.00	$82.00
Multiple Dependent Claims (check if applicable) ☐						$0.00
					BASIC FEE	$790.00
OTHER FEE *(specify purpose)*						$0.00
					TOTAL FILING FEE	$1,070.00

☒ A check in the amount of **$1,070.00** to cover the filing fee is enclosed.

☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **20-1504** as described below. A duplicate copy of this sheet is enclosed.

- ☐ Charge the amount of as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Signature

Dated: **June 26, 1998**

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INTL-0055

(P5902)

APPLICATION

FOR

UNITED STATES LETTERS PATENT

TITLE: **Dynamic Device Profiles**

INVENTOR(S): **Usha Upadhyayula, Yap-Peng Tan, Mannan Mohammed**

Express Mail No: EL091201013US

Date: June 26, 1998

Prepared by: TROP, PRUNER, HU & MILES, P.C.
HOUSTON, TEXAS (713) 468-8880

DYNAMIC DEVICE PROFILES

Background

The invention relates generally to the use of device color profiles used by image color management systems.

One goal of image color management technology is to ensure that a color image, graphic, or text object (hereinafter collectively referred to as graphical objects) is rendered as close as possible to its original intent on any device, despite differences in imaging technologies and color capabilities between devices. To achieve this goal, color characteristics of devices such as scanners, printers, and display monitors may be determined a priori and encapsulated in a device profile.

A device profile is a file that contains information about how to convert colors in the color space of a specific input device (e.g., a scanner) into a device-independent color space, or from a device independent color space into an output device's color space. Typical input and output device color spaces include the red-green-blue (RGB) and cyan-magenta-yellow-black (CMYK) color spaces. One illustrative device-independent or profile color space (PCS) is the Commission Internationale de lÉclairage (CIE) XYZ color space. (See Commission Internationale de lÉclairage Publication 15.2-1986, "Colorimetry, Second Edition.")

Referring to FIG. 1, computer system **100** may include one or more graphical applications **102** that can be used to view and/or modify graphical objects generated by a device such as a digital scanner. Applications **102** may communicate with color management module (CMM) **110**, through application programming interface (API) **104** and graphics **106** and imaging **108** libraries. Profiles **112** may provide CMM **110** with information about how to convert colors

into and out of device color spaces. For example, if the input device is a color scanner, a first profile may provide CMM **110** with information needed to convert the scanner's input color space (e.g., the red-green-blue, RGB) into the PCS. A second profile may provide the necessary information for CMM **110** to convert the PCS into a suitable output color space such as for viewing on a display monitor. One example output color space is the sRGB color space as described in version 1.10 of the document entitled "A Standard Default Color Space for the Internet - sRGB," published by members of Hewlett-Packard Company and Microsoft Incorporated in 1996.

Input and output device profiles **112** are typically created by device manufacturers or third party vendors and may comprise one, or a few different profiles -- where each profile may accommodate different input and output color spaces. In an environment in which one, or at most a few, profiles for each device can be determined a priori, the above described color management scheme may work reasonably well. In an environment in which graphical objects may be subject to a variety of different capture environments (such as images generated by a digital camera), however, a single a priori device profile cannot provide good color reproduction for the different capture environments. Thus, it would be beneficial to provide a technique (apparatus and method) to generate color profiles for graphical objects in a dynamic or automatic fashion.

Summary

In one embodiment the invention provides a method and apparatus to dynamically generate device profiles. These embodiments may include receiving a graphical object having associated profile information, generating a profile based on the associated profile information, and identifying the profile to a color management system. The method may include generating a new graphical object, from the received graphical object, that has had its profile information removed. The act of identifying the profile may include associating a filename with the

profile and communicating the filename to the color management system, perhaps via an application programming interface function call. The method may further include communicating the graphical object to the color management system.

In another embodiment, a method and apparatus to distinguish between a newly received graphical object's profile information and prior received profile information is provided. In these embodiments, if the newly received graphical object's associated profile information is not equivalent to prior received profile information, a new profile is created and identified to the color management system. Equivalence may be determined by comparing profile attribute values such as measurement tag values, and/or illuminant tag values, and/or rendering intents values.

Methods in accordance with the invention may be stored in any media that is readable and executable by a computer system. Illustrative media include: semiconductor memory devices such as EPROM, EEPROM, and flash devices; magnetic disks (fixed, floppy, and removable); other magnetic media such as tape; and optical media such as CD-ROM disks. Further, methods in accordance with the invention may be embodied in a hardware device such as a printed circuit board comprising discrete logic, integrated circuits, or specially designed application specific integrated circuits (ASIC).

Brief Description of the Drawings

Figures 1 shows a computer system using color management and device profiles to process graphical objects.

Figure 2 shows a computer system and graphical object capture device in accordance with one embodiment of the invention.

Figure 3 shows an image file format in accordance with one embodiment of the invention.

Figure 4 shows a technique to generate and use device color profiles in accordance with one embodiment of the invention.

Figure 5 shows a technique to dynamically create a device profile in accordance with another embodiment of the invention.

Figures 6A and 6B show a technique in accordance with FIGS. 4 and 5.

Detailed Description

Techniques (including methods and devices) to dynamically generate device profiles are described. The following embodiments of this inventive concept are illustrative only and are not to be considered limiting in any respect.

Referring to FIG. 2, a representative computer system **200** for use with digital camera **202** is shown. Computer system **200** includes processor **204** coupled to system bus **206** through bridge circuit **208**. Illustrative host processors **204** include the PENTIUM® family of processors and the 80X86 families of processors from Intel Corporation. One illustrative bridge circuit **208** is the 82443LX PCI-to-AGP controller manufactured by Intel Corporation.

Bridge circuit **208** provides an interface for system random access memory (RAM) **210**, accelerated graphics port (AGP) **212** devices such as display unit **214**, and one or more expansion slots **216**. Expansion slots **216** may be personal computer memory card international association (PCMCIA) slots.

Bridge circuit **218** may also couple system bus **206** to secondary bus **220**, while also providing universal serial bus (USB) **222** and integrated device electronics (IDE) **224** interfaces. Common IDE devices include magnetic and optical storage units **226**. Also coupled to secondary bus **220** may be system read only memory (ROM) **228**, keyboard controller (KYBD) **230**, audio device **232**, and input-output (I/O) circuit **234**. One illustrative bridge circuit **218** is the 82371AB PCI-to-ISA/IDE controller manufactured by Intel Corporation. Input-output circuit **234** may provide an interface for parallel **236** and serial **238** ports, floppy disk drives **240**, and infrared ports **242**.

Camera **202** may associate (e.g., store) profile information with each image at the time the image is captured. The associated profile information may include

profile information in accordance with the International Color Consortium's (ICC's) profile format specification, version 3.4, August 1997. Thus, an image file generated by camera **202** may have the structure shown in FIG. 3: a first portion comprising profile information **300** and a second portion comprising image data **302**. Profile information **300**, in turn, may comprise profile header information **304**, tag information table of contents **306**, and tag table data **308** in accordance with the aforementioned ICC profile format specification. In an embodiment where camera **202** is an RGB device and the profile color space (PCS) is the CIE XYZ color space, the ICC profile format specification stipulates that tag table **308** comprise some of the tags enumerated in Table 1. While other device and profile color spaces may be used, for brevity, only RGB and XYZ color spaces will be discussed herein.

Table 1. Illustrative Profile Tag Table Entries

Tag Name	Description
redColorantTag	Red colorant XYZ relative tristimulus value.
greenColorantTag	Green colorant XYZ relative tristimulus value.
blueColorantTag	Blue colorant XYZ relative tristimulus value.
redTRCTag	Red channel tone reproduction curve.
greenTRCTag	Green channel tone reproduction curve.
blueTRCTag	Blue channel tone reproduction curve.
mediaWhitePointTag	Media XYZ white point.

Measurement tags redColorantTag, greenColorantTag, and blueColorantTag represent the relative XYZ values of the input device's (e.g., camera **202**) red, green, and blue colorants. Rendering intent information such as red, green, and blue tone reproduction curve (TRC) tags or attributes may be used by a color management module (CMM) to linearize RGB input and may be ignored if the input data is already linear. Illuminant tag information such as the

mediaWhitePointTag may be used to record the XYZ (e.g., the PCS color space) values of the capture media's (e.g., digital "film") white point. Another illuminant tag that may be recorded by camera **202** and included in an image's profile information **300** is the viewingConditionsType and associated tag value. The viewingConditionsType attribute may record the illuminant condition under which an image is captured such as whether it was taken under daylight, tungsten, or fluorescent lighting conditions. (In one embodiment of the ICC profile format, the mediaWhitePointTag value is used for generating absolute colorimetry and is referenced to the PCS so that the media white point as represented in the PCS is equivalent to this tag value.) Because each image captured by camera **202** may be subject to a different illumination condition it is, in general, not possible to generate a color profile a priori that provides good color reproduction of the captured image. This is one distinguishing feature between a digital camera and other image capture devices such as digital scanners which have a substantially constant capture environment. The lack of certainty in describing an image's illuminant condition means that, without a means of generating a device profile based on the image itself, the ability of a color management system to render the image as close as possible to its original intent on any device, despite differences in imaging technologies and color capabilities between devices, is substantially limited.

One method to dynamically generate a device profile is illustrated in FIG. 4. First, camera **202** captures an image in a file, including therein profile data in accordance with FIG. 3 and Table 1 (step **400**). At some later time, the image file may be transferred to computer system **200** (step **402**). Computer system **200** may then use the image file's profile information **300** portion to generate a profile file in accordance with the ICC profile specification (step **404**). The dynamically generated profile is assigned a unique filename, and this filename is passed to the CMM (step **406**). Notification, or identification of the dynamically generated profile's filename to the CMM may be accomplished in a number of ways such as

through application programming interface (API) calls. Having a profile that accurately reflects the image's taking/capture conditions, the CMM can faithfully process the image in accordance with user instructions and the generated device profile (step **408**).

In another embodiment, referred to herein as the "live" mode of operation, camera **202** is coupled to computer system **200** during image capture, periodically transferring captured images in an automated manner. By way of example, camera **202** may be coupled to computer system **200** via electrical cable, radio frequency or infrared transmission channels, and may transfer images to computer system **200** at a rate of up to approximately 30 images per second. The transfer may be initiated by computer system **200** or by camera **202**. When camera **202** is coupled to computer system **200**, the probability of successive images having different taking conditions is relatively small. Thus, when operating in the live mode, it may not be necessary to create a new profile for every image that is transferred from camera **202** to computer system **200**.

Referring to FIG. 5, computer system **200** receives an image file and designates it as the "current" image (step **500**). Next, the current image's profile data **300** (see FIG. 3) is compared to that associated with previously transferred profile image data (step **502**). In particular, those values associated with profile tags that are subject to change based on changes in capture environment (e.g., redColorantTag, greenColorantTag, blueColorantTag, mediaWhitePointTag, and viewingConditionsTag data values) may be compared to previously transferred tag table data that has been used to create prior profiles (see discussion below and Table 1). These prior profiles may have been created in accordance with FIG. 5. For example, if no prior profiles exist, step **502** may perform no operation and the 'no' prong of step **504** is traversed.

If there is no match (the 'no' prong of step **504**), a new profile is generated as described above and assigned a unique filename (step **506**). The newly created profile may be indexed in a manner that allows its use with another image (step

508), and the CMM is notified of the new profile's filename via an appropriate applications programming interface (API) call (step **510**). In one embodiment, a profile is generated for each unique set of tag table data, and a list/table of the filenames and associated profile information is kept available so that each incoming (i.e., current) image's profile data may be compared to prior unique profile data. In another embodiment, a new profile is generated (step **506**) only when the current image's profile information differs from previous profile data by a specified amount. For example, a new profile may be created when the current image's mediaWhitePointTag value differs from a previous profile's mediaWhitePointTag value by a first specified percentage, or when the viewingConditionsTag value differs from a second specified percentage.

If there is a match between the current image's profile data and profile data associated with a previous image (the 'yes' prong of step **504**), the filename associated with the matching profile's data is determined (step **512**) and provided to the CMM through an appropriate API call (step **510**). If the live mode session is complete (the 'yes' prong of step **514**), processing is terminated (step **516**). If the live mode session is not complete (the 'no' prong of step **514**), processing continues at step **500**.

In another embodiment, the ability to distinguish between live mode and non-live mode operations may be provided in a single application (comprising one or more computer programs) as shown in FIGS. 6A and 6B. First, an image may be generated by a digital camera or other suitable device (step **600**) and transferred to, and received by, an application program executing on a computer system (step **602**). If the imaging device coupled to the computer system is not operating in the live mode (the 'no' prong of step **604**), a new profile may be generated (step **606**, see also FIG. 5 and associated description). The CMM may then be notified of the image's profile (step **608**) which is then processed (step **610**). When not operating in the live mode (the 'no' prong of step **612**), the just created profile is deleted (step **614**) and processing terminates (step **616**).

If the imaging device is operating in the live mode (the 'yes' prong of step **604**), the received image's profile information is compared with existing (i.e., previously generated and stored) profile data that is subject to change based on the image's capture environment such as changes in illuminant tag values such as mediaWhitePointTag and viewingConditionsTag values, or measurement tag values such as redColorantTag, greenColorantTag, and blueColorantTag values (step **618**). If there is no match (the 'no' prong of step **620**), a new profile is generated, assigned a unique filename, and indexed as described above and shown in FIG. 5 (steps **622** and **624**). After the CMM is notified of the image through appropriate API calls (step **608**), it processes the image (step **610**). A check may then be made to determine if the live mode session is complete (via the 'yes' prong of step **612**). If the live mode is complete (the 'yes' prong of step **626**), previously created profiles are deleted (step **614**) and processing terminates (step **616**). If the live mode is not complete (the 'no' prong of step **626**), processing continues at step **602**.

If there is a match between the current image's profile information and previous profile data (the 'yes' prong of step **620**), that profile associated with the matching profile data is determined (step **628**) and processing continues at step **608**.

One advantage of dynamically generating device profiles is that each graphical object (e.g., an image) may be rendered as close as possible to its original intent on any device, despite differences in the imaging technologies and color capabilities between the device that captured the graphical object and the device displaying the graphical object. Another advantage of dynamically generated device profiles in accordance with one embodiment of the invention is that existing color management application programs are not required to be modified -- they may interact with dynamically generated device profiles via a standard application programming interface. Yet another advantage of dynamically generated profiles is that in live mode the number of profiles needed

to accurately process a large number of images may be small. (This is because a camera's capture environment is not likely to change frequently when coupled to a computer system.) In these cases, only a few unique profiles are created (see FIGS. 6A and 6B) and so operational memory requirements (e.g., to store the dynamically generated profiles) and speed (e.g., the time to compare those tag values subject to change) may be small.

Various changes in the materials, components, circuit elements, as well as in the details of the illustrated operational methods are possible without departing from the scope of the claims. For example, an image capture device may be a digital camera or any other device capable of providing an image containing device profile information. Thus, previously captured image files may be provided from computer storage such as magnetic and optical disks, magnetic tape, and flash memory devices. In one embodiment, an image capture device may be coupled to computer system **200** through expansion slots **216** or through I/O circuit **228**.

Method steps of FIGS. 4, 5, and 6A and 6B may be performed by a computer processor (e.g., processor **204**) executing instructions organized into a program module or a custom designed state machine. Storage devices suitable for tangibly embodying computer program instructions include all forms of non-volatile memory including, but not limited to: semiconductor memory devices such as EPROM, EEPROM, and flash devices; magnetic disks (fixed, floppy, and removable); other magnetic media such as tape; and optical media such as CD-ROM disks. Further, the methods described herein may be embodied in a hardware device such as a printed circuit board comprising discrete logic, integrated circuits, or specially designed application specific integrated circuits (ASIC).

What is claimed is:

1. A method comprising:
receiving a graphical object having associated profile information;
generating a profile based on the associated profile information; and
identifying the profile to a color management system.

2. The method of claim 1, wherein generating a profile comprises:
storing a portion of the associated profile information in a profile file;
associating a filename with the profile; and
communicating the filename to the color management system.

3. The method of claim 2, wherein storing a portion of the associated profile information comprises storing a value representative of a color relation between an input color space and a profile color space.

4. The method of claim 3, wherein the stored value comprises an illuminant tag value.

5. The method of claim 4, wherein the illuminant tag value comprises a mediaWhitePointTag value.

6. The method of claim 2, further comprising storing a redColorantTag value and a greenColorantTag value and a blueColorantTag value.

7. A program storage device, readable by a device, comprising:

instructions stored thereon for causing the device to

receive a graphical object having associated profile information;

generate a profile based on the associated profile information; and

identify the profile to a color management system.

8. The program storage device of claim 7, wherein the graphical object comprises an image.

9. The program storage device of claim 7, wherein the instructions to generate a profile comprise instructions to:

store a portion of the associated profile information in a profile file; and

remove the associated profile information from the graphical object to generate a second graphical object.

10. The program storage device of claim 7, wherein the instructions to identify comprise instructions to:

associate a filename with the profile; and

communicate the filename to the color management system.

11. The program storage device of claim 7, wherein the color management system comprises an application program to render the received image.

12. The program storage device of claim 7, further comprising instructions to communicate the graphical object to the color management system.

13. The program storage device of claim 7, wherein the color management system comprises an application to render the received image.

14. A system comprising:

a computer system having a bus;

a device, operatively coupled to the bus, to capture a graphical object, the graphical object having a profile information portion and a data portion; and

a generator, operatively coupled to the device, to generate a profile based on the profile information portion.

15. The system of claim 14, wherein the device comprises a digital camera.

16. The system of claim 14, wherein the profile comprises an illuminant tag attribute value.

17. The system of claim 16, wherein the illuminant tag attribute value comprises a mediaWhiteTag attribute value.

18. The system of claim 14, wherein the profile comprises an measurement tag attribute value.

19. The system of claim 14, further comprising a circuit, operatively coupled to the generator, to communicate the profile to a color management system.

20. The system of claim 19, wherein the color management system comprises an application program to render the graphical object.

21. The system of claim 19, further comprising a second circuit, operatively coupled to the device, to communicate the data portion to the color management system.

22. A method comprising:

receiving a graphical object having a profile information part and a data part;

comparing at least a portion of the profile information part to at least a portion of a prior received profile information part and, based on the comparison, identifying a current profile information part to a color management system.

23. The method of claim 22, wherein the current profile information part comprises at least a portion of the profile information part.

24. The method of claim 22, wherein the current profile information part comprises at least a portion of the prior received profile information part.

25. The method of claim 22, wherein comparing comprises comparing an illuminant tag value.

26. The method of claim 22, wherein the illuminant tag value comprises a mediaWhitePointTag value.

27. The method of claim 22, wherein the illuminant tag value comprises a viewingConditionsTag value.

28. The method of claim 22, wherein identifying the profile information part comprises:

generating a profile based on the profile information part;

identifying the profile to the color management system; and

storing the generated profile.

29. The method of claim 28, wherein identifying the profile to the color management system comprises notifying the color management system through an application programming interface call.

DYNAMIC DEVICE PROFILES

Abstract

Device information is extracted from a graphical object's data file to dynamically generate a profile suitable for processing by a color management system. In one embodiment, the graphical object is an image and the graphical object's data file is generated by a digital camera.

INTL-0055 (P5902)

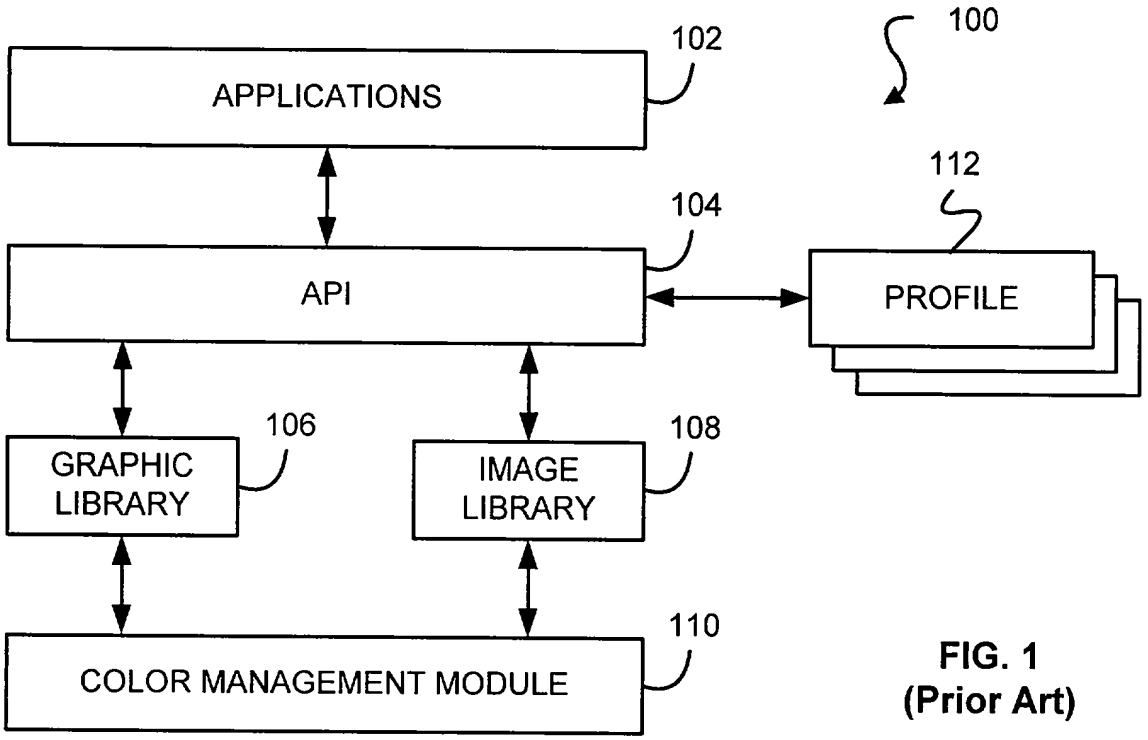


FIG. 1
(Prior Art)

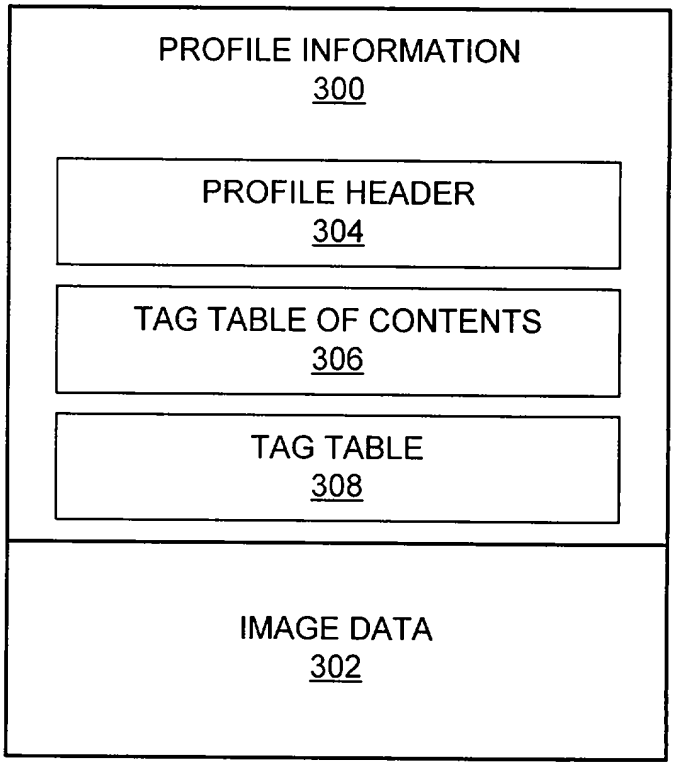
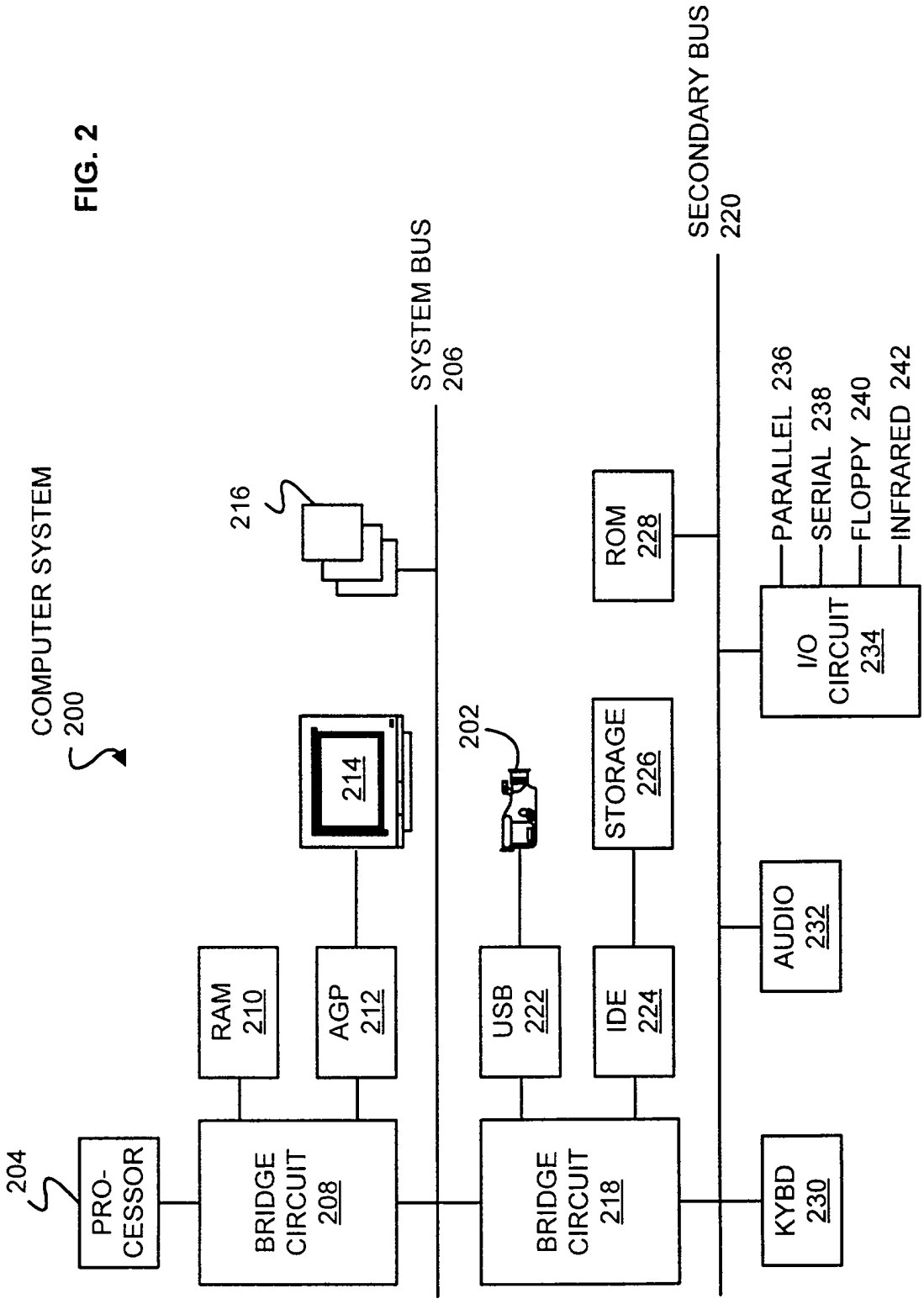


FIG. 3

FIG. 2


COMPUTER SYSTEM
200
204
PRO-CESSOR
BRIDGE CIRCUIT 208
RAM 210
AGP 212
214
216
SYSTEM BUS 206
202
USB 222
BRIDGE CIRCUIT 218
IDE 224
STORAGE 226
ROM 228
SECONDARY BUS 220
AUDIO 232
KYBD 230
I/O CIRCUIT 234
PARALLEL 236
SERIAL 238
FLOPPY 240
INFRARED 242

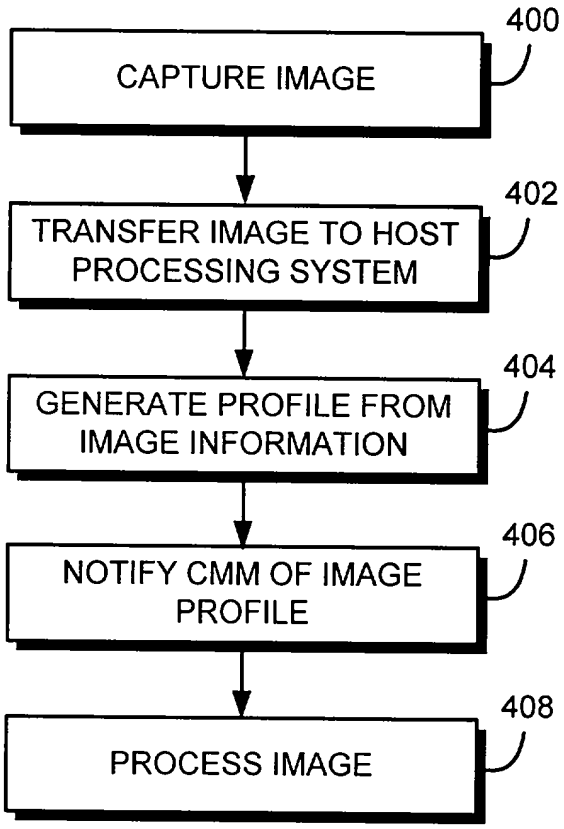

400
CAPTURE IMAGE
402
TRANSFER IMAGE TO HOST PROCESSING SYSTEM
404
GENERATE PROFILE FROM IMAGE INFORMATION
406
NOTIFY CMM OF IMAGE PROFILE
408
PROCESS IMAGE

FIG. 4

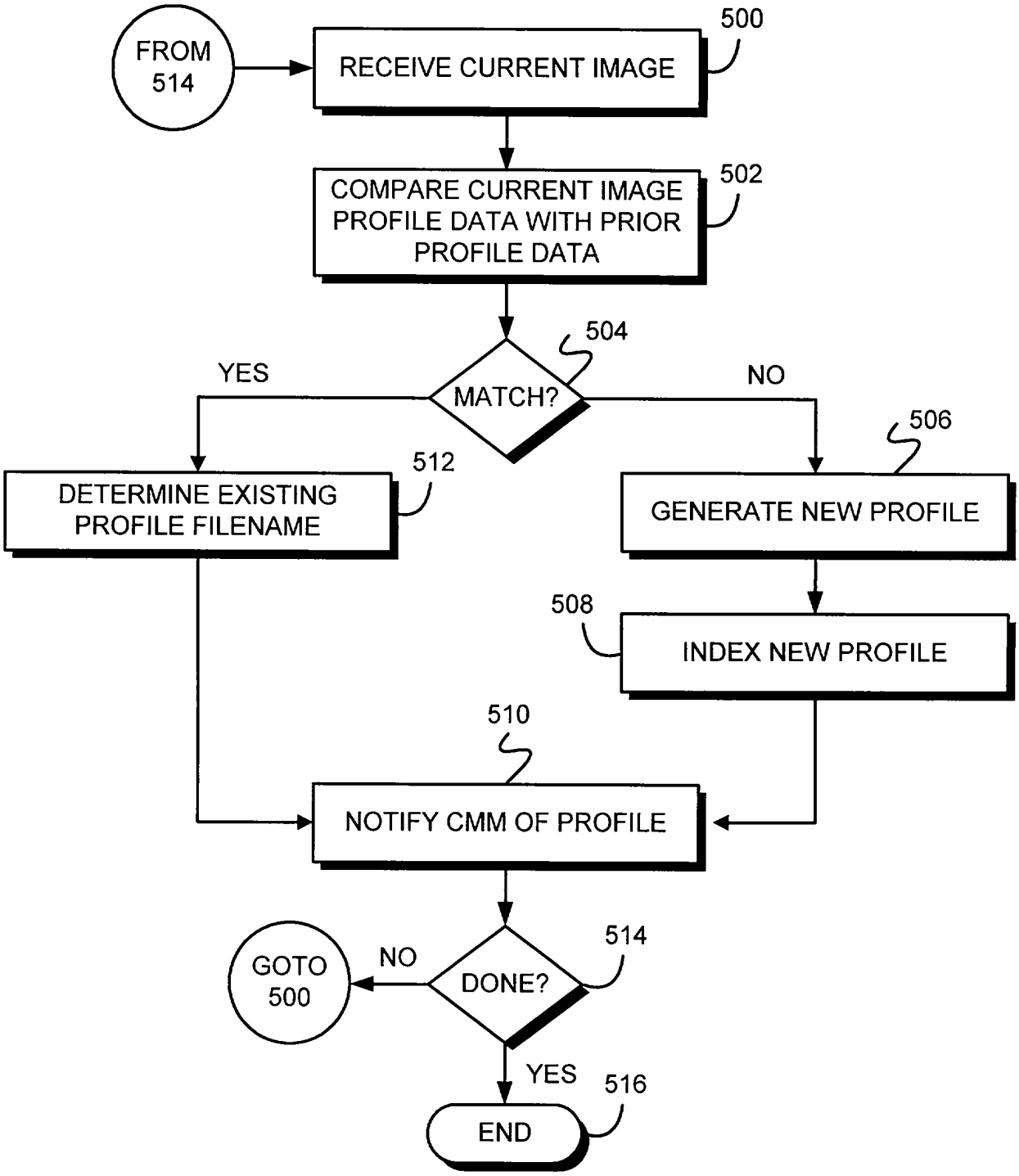

FROM 514
RECEIVE CURRENT IMAGE
500
COMPARE CURRENT IMAGE PROFILE DATA WITH PRIOR PROFILE DATA
502
MATCH?
504
YES
NO
DETERMINE EXISTING PROFILE FILENAME
512
GENERATE NEW PROFILE
506
INDEX NEW PROFILE
508
NOTIFY CMM OF PROFILE
510
DONE?
514
NO
GOTO 500
YES
END
516

FIG. 5

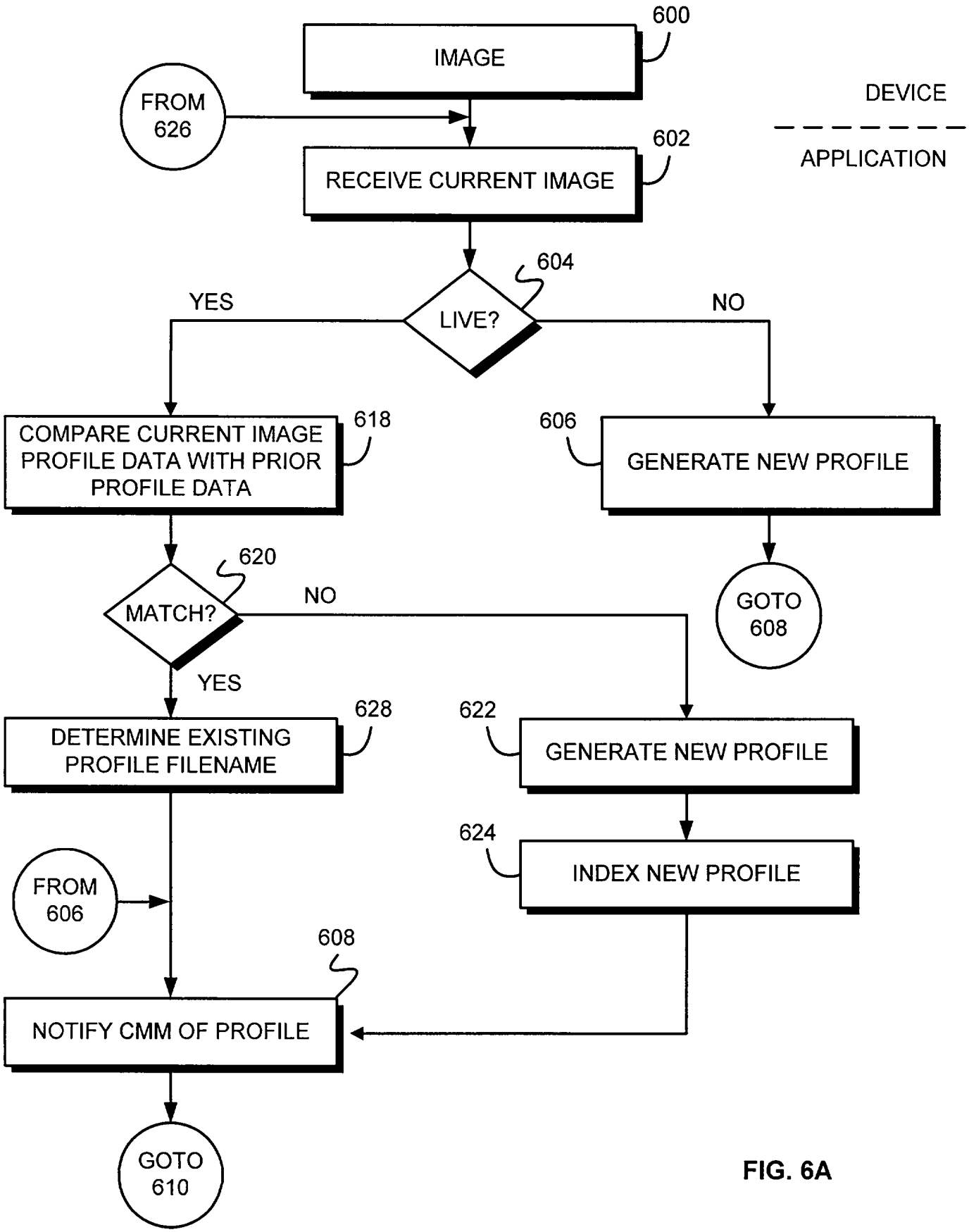

600
IMAGE
FROM 626
DEVICE
APPLICATION
602
RECEIVE CURRENT IMAGE
604
LIVE?
YES
NO
618
COMPARE CURRENT IMAGE PROFILE DATA WITH PRIOR PROFILE DATA
606
GENERATE NEW PROFILE
620
MATCH?
NO
GOTO 608
YES
628
DETERMINE EXISTING PROFILE FILENAME
622
GENERATE NEW PROFILE
624
INDEX NEW PROFILE
FROM 606
608
NOTIFY CMM OF PROFILE
GOTO 610

FIG. 6A

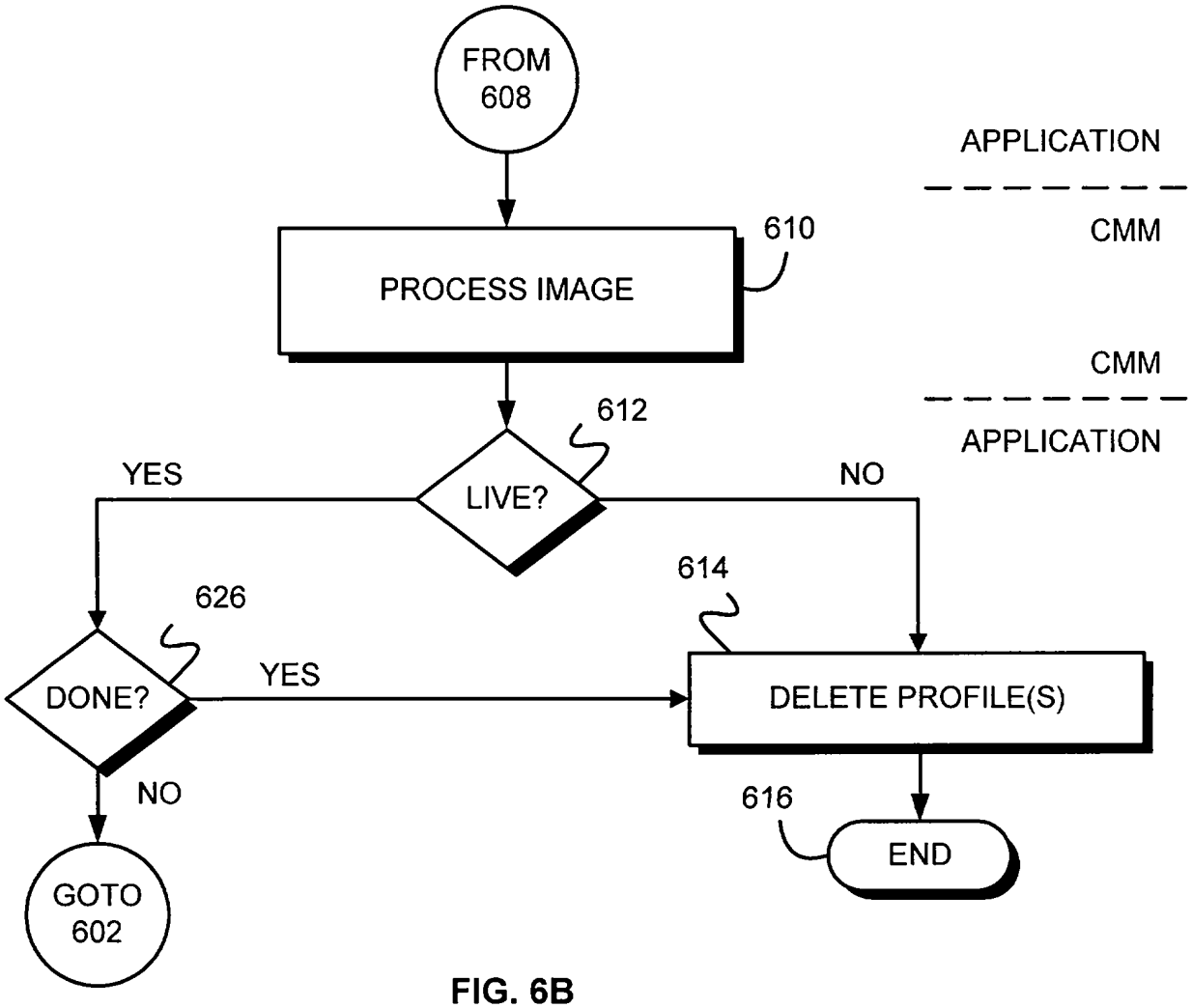

FROM
608
APPLICATION
CMM
610
PROCESS IMAGE
CMM
APPLICATION
612
LIVE?
YES
NO
614
626
DONE?
YES
DELETE PROFILE(S)
NO
616
END
GOTO
602

FIG. 6B

Attorney's Docket No.: INTL-0055 (P5992) PATENT

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

DYNAMIC DEVICE PROFILES

the specification of which

[X] is attached hereto.
[ ] was filed on _____ as
United States Application Number _____
or PCT International Application Number _____
and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I do not know and do not believe that the claimed invention was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of American on an application filed by me or my legal representatives or assigns more than twelve months (for a utility patent application) or six months (for a design patent application) prior to this application.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):			Priority Claimed	
Number	(Country)	(Day/Month/Year Filed)	Yes	No
Number	(Country)	(Day/Month/Year Filed)	Yes	No
Number	(Country)	(Day/Month/Year Filed)	Yes	No

I hereby claim the benefit under title 35, United States Code, Section 119(e) of the United States provisional application(s) listed below:

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Number)	Filing Date	(Status-patented, pending, abandoned)
(Application Number)	Filing Date	(Status-patented, pending, abandoned)

I hereby appoint Timothy N. Trop, Reg. No. 28,994; Fred G. Pruner, Jr., Reg. No. 40,779, Dan C. Hu, 40,025; Coe F. Miles, Reg. No. 38,559, my patent attorneys, of TROP, PRUNER, HU & MILES, P.C., with offices located at 8550 Katy Freeway, Ste. 128, Houston, TX 77024, telephone (713) 468-8880, and Joseph R. Bond, Reg. No. 36,458; Richard C. Calderwood, Reg. No. 35,468; Sean Fitzgerald, Reg. No. 32,027; David J. Kaplan, Reg. No. 41,105; Leo V. Novakoski, Reg. No. 37,198; Naomi Obinata, Reg. No. 39,320; Thomas C. Reynolds, Reg. No. 32,488; Steven P. Skabrat, Reg. No. 36,279; Howard A. Skaist, Reg. No. 36,008; Steven C. Stewart, Reg. No. 33,555; Raymond J. Werner, Reg. No. 34,752; and Charles K. Young, Reg. No. 39,425; my patent attorneys, of INTEL CORPORATION; with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

Send correspondence to Timothy N. Trop, TROP, PRUNER, HU & MILES, P.C., 8550 Katy Freeway, Ste. 128, Houston, TX 77024 and direct telephone calls to COE F. MILES, (713) 468-8880.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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INTL-0055 (P5892)
Declaration